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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/748,619	12/27/2003	Vladimir S. Moxson		7498

7590 08/25/2009  
ADVANCE MATERIALS PRODUCTS, INC.  
1890 GEORGETOWN ROAD  
HUDSON, OH 44236

EXAMINER
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ZHU, WEIPING

ART UNIT	PAPER NUMBER
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1793

MAIL DATE	DELIVERY MODE
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08/25/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/748,619

**Applicant(s)**

MOXSON ET AL

**Examiner**

WEIPING ZHU

**Art Unit**

1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 June 2009 and 18 May 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 2-14 and 17-20 is/are pending in the application.
- 4a) Of the above claim(s) 5-14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2-4 and 17-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/888)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 25, 2009 has been entered.

***Status of Claims***

2. Claims 2-4 and 17-20 are currently under examination wherein claim 19 has been amended and claim 20 has been newly added in applicant's amendment filed on May 18, 2009.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 2, 3, and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brupbacher et al. (US 5,059,490) in view of Gottselig et al. (US 4,961,529).

With respect to claims 18-20, Brupbacher et al. ('490) discloses a fully-dense discontinuously-reinforced titanium matrix composite material comprising (col. 1, lines 30-43, col. 3, lines 23-58, col. 4 lines 3-50 and col. 4, line 63 to col. 5, line 8):

- a. a matrix of a titanium alloy;
- b. ceramic and/or intermetallic hard particles comprising SiC and intermetallic of various metals present as desired in the matrix; and
- c. complex carbide particles comprising Ti, Zr, Hf, V, Nb, Ta, Cr, Mo and W separately provided in a reaction mixture that are at least partially soluble in the matrix at the sintering or forging temperature such as TiVC dispersed in the matrix; and
- d. complex carbide-aluminide particles such as TiVC/TiAl, suggesting the claimed complex carbide-aluminide particles of  $Al_4SiC_4$ ,  $Al_4SiC_4$  or  $Al_4SiC_4$  would be formed in the presence of SiC and Al during the direct synthesis process of Brupbacher et al. ('490).

Brupbacher et al. ('490) does not specify the presence of the complex carbide-silicide particles in the titanium matrix composite material as claimed. Gottselig et al. ('529) discloses forming  $Ti_3SiC_2$  by reacting Ti with SiC (abstract). It would have been obvious to one of ordinary skill in the art that during the direct synthesis process of Brupbacher et al. ('490), the claimed  $Ti_3SiC_2$  would be formed in the presence of SiC and Ti as evidenced by Gottselig et al. ('529) (abstract). Brupbacher et al. ('490) does not specify the amounts of the ceramic and/or intermetallic hard particles as claimed in the instant claims 18 and 20 and the amounts of the complex carbide-silicide particles

and the complex carbide-aluminide particles as claimed in the instant claim 19.

However, Brupbacher et al. ('490) discloses that the total ceramic whisker loadings range from less than 5 to greater than 90 volume percent (col. 4, lines 3-10), which overlaps the claimed ranges. A prima facie case of obviousness exists. See MPEP 2144.05 I.

With respect to claim 2, Brupbacher et al. ('490) discloses that the porosity in the composite material can be eliminated (col. 8, lines 1-15), which reads on the claimed feature.

With respect to claim 3, Brupbacher et al. ('490) discloses that the matrix alloy is a titanium aluminide (col. 3, lines 48-58).

4. Claims 4 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brupbacher et al. (US 5,059,490) in view of Gottselig et al. ('529) as applied to claim 18 above and further in view of Toyoda et al. (US Pub. 2003/0084969 A1).

With respect to claim 4, Brupbacher et al. ('490) discloses that the ceramic and/or intermetallic hard particles comprise silicon carbide or titanium carbide particles (col. 1, lines 30-43 and col. 2, lines 44-60). Brupbacher et al. ('490) does not specify the  $TiCr_2$  as claimed. Toyoda et al. ('969 A1) discloses forming  $TiCr_2$  by reacting Cr with Ti (paragraphs [0037]-[0038]). It would have been obvious to one of ordinary skill in the art that during the direct synthesis process of Brupbacher et al. ('490), the claimed  $TiCr_2$  would be formed in the presence of Cr and Ti as evidenced by Toyoda et al. ('969 A1) (paragraphs [0037]-[0038]).

With respect to claim 17, Brupbacher et al. ('490) discloses that the composite material comprises silicon carbide and graphite as whisker material (col. 1, lines 30-43) in an amount of from less than 5 to greater than 90 volume percent (col. 4, lines 3-10).

***Response to Arguments***

5. The applicant's arguments filed on May 18, 2009 have been fully considered but they are not persuasive.

First, the applicant argues that neither Gottselig et al. ('529) nor Toyoda et al. ('969 A1) relates to titanium matrix composite materials; and Brupbacher et al. ('490) in view of Gottselig et al. ('529) and further in view of Toyoda et al. ('969 A1) does not disclose titanium matrix composite articles having improved mechanical properties as claimed in instant claims 2-4 and 17-20. In response, the examiner notes that the ground of rejections of the claimed titanium matrix composite material relies on the teaching of Brupbacher et al. ('490) rather than those of Gottselig et al. ('529) and Toyoda et al. ('969 A1). No mechanical properties are recited in the instant claims, and therefore Brupbacher et al. ('490) in view of Gottselig et al. ('529) and Toyoda et al. ('969 A1) are not required to disclose such properties of the titanium matrix composite materials in order to render the claimed materials obvious.

Second, the applicant argues that Toyoda et al. ('969 A1) limits the total content of the intermetallic particle additions to 15% or below. In response, the examiner notes that the ground of rejection of the content of the ceramic and/or intermetallic hard particles relies on the teaching of Brupbacher et al. ('490) rather than the teaching of

Toyoda et al. ('969 A1). See the reason of the rejection of the claimed contents as stated in the Section 3 above.

Third, the applicant argues that none of the prior art references contains aluminum-vanadium  $Al_8V_5$  hard particles which are additionally incorporated into titanium matrix according to instant claim 4. In response, the examiner notes that the titanium matrix composite material of Brupbacher et al. ('490) in view of Gottselig et al. ('529) and Toyoda et al. ('969 A1) contains  $TiCr_2$  as recited in instant claim 4. The presence of  $Al_8V_5$  in the material is not required in the instant claim 4.

### ***Conclusions***

6. This Office action is made non-final. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Weiping Zhu whose telephone number is 571-272-6725. The examiner can normally be reached on 8:30-16:30 Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Roy King/  
Supervisory Patent Examiner, Art  
Unit 1793

WZ

7/28/2009